with headache symptoms (16.97 ± 0.54 vs. 5.38 ± 0.39, $p < 0.0001$). CM also missed more days due to illnesses other than headache than EM participants (13.66 ± 1.98 vs. 9.33 ± 1.42, $p < 0.01$). CM and EM reported working at about half of their full effectiveness with headache symptoms ($p > 0.05$). CM reported experiencing more impairment on work ability or activity than EM (CM = 31.1%, EM = 24.4%), or requiring more bed rest (CM = 33.5%, EM = 26.2%) when experiencing severe headaches. **CONCLUSIONS**: Migraine adversely affected presenteeism and increased absenteeism of migraine sufferers, particularly among those with CM, who missed more days and worked more days with headache than EM.

**PND14**

## COSTS OF ILLNESS IN PARKINSON'S DISEASE IN SIX EUROPEAN COUNTRIES

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**OBJECTIVES:** To evaluate the direct and indirect costs of Parkinson´s Disease (PD) in a survey of five European countries and Russia. So far, cost-of-illness (COI) studies on PD have been conducted in some European countries only, none in Austria, Czech Republic, Portugal and Russia. The prevalence of PD in Europe varies between 115 and 221 per 100,000, due to aging of population the number of persons affected is expected to double within the next 25 years. **METHODS**: Between 2003—2005 about 100 patients of PD were recruited per study center. Clinical status (Hoehn & Yahr stage, Unified Parkinson's Disease Rating Scale) was evaluated. Economic data were collected over a 6 months period using the "bottom-up" approach. Indirect costs were calculated by the human capital approach. Informal care was monetary valued. **RESULTS**: The total mean costs per patient ranged from €2620 to €9812 for the 6-months observation period. Direct costs made about 60% to 70%, indirect costs made 30% to 40% of total costs. Forty-seven percent to 92% of direct costs were on the account of the national health insurance systems. Patients' co-payments constituted up to 14% of direct costs. Informal care generally was the prevalent form of care for PD patients. In half of the participating countries it was the major source of expenditure. **CONCLUSIONS**: This is the first observational study on the burden of PD across European countries and Russia. Costs of PD across Europe vary considerably. Reasons are multiple; differences in prices, health systems and traditions are some. PD represents a major burden on the individual, family, health services and society in Europe, especially in Eastern European countries. A major cost factor is the cost for care, which has enormous importance due to demographic development and extension of life expectancy.

**PND15**

## THE POTENTIAL ECONOMIC IMPACT OF GENERIC SUBSTITUTION OF TOPIRAMATE ON HEALTH CARE COSTS IN THE G4 EUROPEAN COUNTRIES

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**OBJECTIVES:** To examine the economic impact of generic substitution of the anti-epileptic drug (AED) Topiramate in Canada; and convert observed Canadian costs into the settings of France, Germany, Italy and the UK (UK). **METHODS**: Retrospective health claims from Québec's provincial health plan (RAMQ) between January 2006 and September 2008, and IMS Health data on European AED sales between 1998 and 2008 were used. Patients with epilepsy (ICD-9: 345, 780.3, 780.39) and ≥2 topiramate dispensings were selected. Patient-level health care utilization costs in Canada were calculated during mutually-exclusive periods of brand versus generic use of topiramate. Annualized Canadian health care costs were projected in each country (€2007/person-year) using Canadian rates, European prices and service-use ratios. Using market-level sales, topiramate utilization were forecasted for 12 months following expected generic entry (September 2009-September 2010) using autoregressive and panel-data regression models. The impact of generic entry was projected for each country, stratified into its effect on market size, topiramate costs, and other health care costs. **RESULTS**: A total of 1164 patients (mean age: 39.8 years, 61.7% female) were observed for 2.6 years on average. Projected per-patient health care costs in G4 European countries, excluding Topiramate, would be significantly higher during generic-use periods (adjusted cost differences per person-year: €706 to €815, $p < 0.001$ for all comparisons) compared to brand-use periods. Assuming mandatory generic substitution for all patients, predicted system-wide increases in total adjusted health care costs would range from 3.5% (UK) to 24.4% (France) one year after generic entry. Increases in non-Topiramate health care costs (+13.7% to +18.1%) would more than offset savings in incremental Topiramate brand costs (−6.3% to −13.8%) in France, Italy, and the UK. **CONCLUSIONS**: The generic entry of Topiramate in Europe is projected to be associated with higher health care costs, representing a trade-off between reduced generic drug expenditures and increased health care costs.

**PND16**

## ECONOMIC IMPACT OF GENERIC ENTRY OF TOPIRAMATE IN GERMANY: CONVERSION OF THE CANADIAN EXPERIENCE INTO THE SETTINGS OF GERMANY

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**OBJECTIVES:** investigated the impact of generic substitution of the branded antiepileptic drug (AED) Topiramate (Topamax®) on medical service utilization and costs for patients with epilepsy in Germany. **METHODS**: Retrospective health claims from Québec's provincial health plan (RAMQ) between January 2006 and September 2008 were analyzed. Patients with epilepsy (ICD-9: 345, 780.3 or 780.39) and ≥2 topiramate (Topamax®) dispensings were selected. Patient-level health care utilization and costs in Canada were calculated during mutually-exclusive periods of brand versus generic use of topiramate. Annualized Canadian health care costs were converted into a German setting (€2007/person-year) by applying purchasing power parities, service-use ratios and exchange rates. Using market-level sales, branded and generic topiramate utilization were forecasted for 12 months following expected generic entry (September 2009-September 2010) using autoregressive and panel-data regression models. Non-parametric bootstrap procedure was used to determine statistical significance for the cost measures. Budgetary consequences for sick funds, individual and private payers were assessed. **RESULTS**: After adjusting for covariates, periods of generic topiramate use were associated with significant increases in pharmacy dispensings (other AEDs: +6%, non-AEDs: +31%, $p < 0.001$), a 17% increase in hospitalizations ($p = 0.015$), and 21% longer lengths of hospital stays ($p < 0.001$). Converted per-patient health care costs excluding topiramate were estimated to be significantly higher for generic relative to brand periods in Germany (adjusted cost difference per person-year [95% CI]: €710 [€149–€1283]; $p = 0.001$). Assuming mandatory generic substitution for all patients, predicted system-wide increase in total adjusted health care costs would be 23.2% one year after generic entry. This impact would be evenly distributed among payers. **CONCLUSIONS**: Generic entry of topiramate in Germany would represent a trade-off between reduced generic drug expenditures and increased health care costs due to higher AED and non-AED spending, as well as increased hospitalizations and outpatient visits. Increased total cost is expected to outweigh the benefit of reduced drug costs.

**PND17**

## THE COST-EFFECTIVENESS OF DEEP BRAIN STIMULATION IN PARKINSON'S DISEASE PATIENTS

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**OBJECTIVES:** In addition to medical treatment, deep brain stimulation (DBS) has become an alternative therapeutical option in advanced Parkinson's disease, especially for motor complications such as dyskinesias or motor fluctuations. High initial costs of surgery and subsequent time-consuming maintenance procedures may be traded off by long-term gains in quality of life (HrQoL) compared to conventional medication treatment. This leads to the question whether DBS is cost effective compared to best medical treatment. **METHODS**: We present a lifetime Markov model for Parkinson's disease, comparing deep brain stimulation vs. best medical treatment and estimating the impact on health-related quality of life. HrQoL was measured by the EQ-5D and cost from the societal perspective of Germany. Both were discounted with 3% p.a.. Data on DBS efficacy and adverse events were taken from clinical studies and published reports or meta-analyses. Key assumptions on the surgery procedure and its durability, its impact on cost and HrQoL, mortality, prevalence of motor complications as well as stage transition probabilities and the discount rate were investigated by one- and two-way sensitivity analyses. **RESULTS**: The incremental cost effectiveness ratio (ICER) for DBS was €42,183 per QALY gained. Incremental DBS costs were due to cost for surgery and subsequent battery change. HrQoL was improved and motor complications were reduced. The following variables had most impact in sensitivity analyses: utility improvement under DBS, drug and surgery cost, progression rates, and discount rate leading to varying ICERs between 20,064 and €58,147/QALY (the latter due to extreme and unlikely parameter combinations). **CONCLUSIONS**: Based on our decision analysis using current guidelines, DBS is likely to be cost-effective compared with other well-accepted health care technologies. We suggest to adopt DBS for patients with high drug cost or severe motor complications.

**PND18**

## COST-EFFECTIVENESS OF A NEW ABSORBABLE HYDROGEL FOR THE PREVENTION OF CSF LEAKS IN FRENCH HOSPITALS

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**OBJECTIVES:** The objective was to demonstrate the cost-effectiveness of a new absorbable hydrogel used in craniotomies compared to the option "do nothing" in France. **METHODS**: A Markov model was fed with clinical data from Grotenhuis and al. (Surg. Neurol. 2005;64:490–3) and with cost data from the French cost database (2006 data based on DRG (GHM) 01C04V craniotomy without complication and 01C04W craniotomy with complication). The model was run with three stages (T0: date of surgery; T1: 1-month follow-up; T2: 3-month follow-up) and three states